DOCUMENT RESUME

ED 406 698 CS 509 475

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TITLE The Readability, Recall and Reaction to On-Line Newspaper Pages with Visuals and Those Without.
PUB DATE 24 Nov 96
NOTE 9p.; Paper presented at the Annual Meeting of the Speech Communication Association (82nd, San Diego, CA, November 23-26, 1996).
PUB TYPE Reports - Research (143) -- Speeches/Meeting Papers (150)
EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Computer Mediated Communication; *Electronic Publishing; Higher Education; *Illustrations; *Internet; Media Research; *Newspapers; *Photographs; Readability; Recall (Psychology)
IDENTIFIERS *Visual Communication; Weber State University UT

ABSTRACT

The importance of visuals to communication is nothing new. Visuals attract more attention, convey more information more quickly, and are more memorable and possibly even more believable than text. What is new in communication is the extensive use of visuals in on-line publications. While visuals take a long time to materialize on the computer screen, this may not always be the case; therefore, it is worthwhile asking how important visuals are to on-line browsers and readers. In a study, 2 on-line publications were viewed by 30 undergraduates at Weber State University. (Utah). About 30% of the subjects had never viewed an on-line publication. Results showed that subjects looking at the visual version spent an average of 14 minutes longer viewing and reading; further, they read more stories in the publication than their counterparts looking at the non-visual version. Results also showed that those viewing the visual version were able to recall slightly more stories than their counterparts. In response to a question after the reading section of the study, participants said they preferred the visual over the non-visual version of the publication. It appears that readers on-line would prefer to have their news prioritized and organized for them in much the same manner as it is currently done in print versions. (Includes 16 notes.) (TB)

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THE READABILITY, RECALL AND REACTION TO ON-LINE NEWSPAPER PAGES WITH VISUALS AND THOSE WITHOUT

Paper presented at SCA
San Diego, Calif.
Nov. 24, 1996

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The importance of visuals to communication is nothing new. Visuals attract more attention[1], convey information more quickly[2], are more memorable[3] and possibly more believable[4] than text. And perhaps most importantly, readers love them[5].

What is new in communication is the extensive use of visuals in on-line publications. Graphical browsers such as Netscape Navigator, Microsoft Explorer or NCSA Mosaic allow readers to view visuals --photographs, drawings, charts, graphs, maps, you name it -- along with the text. But with on-line publications, there's a problem. The visuals require a relatively large amount of time to display on the computer screen. And readers don't love that.

Yes, a picture, instantly perceived, might be worth a thousand words. But how valuable is it if it requires substantially more time to display than the thousand words it replaces?

This important question is posed by on-line researcher and consultant Eric K. Meyer in his 1995 report, "Tomorrow's News Today[6]." According to Meyer, a 3-by-5-inch graphic stored in standard GIF format would take almost a full second to transmit on the World Wide Web under optimum conditions. Under more common conditions, each might require as much as 28 seconds.

"Conventional wisdom dictating that on-line publications be intense multimedia experiences is, therefore, extremely ill-advised," Meyer says. But realizing the importance of visuals to communication, Meyer is quick to point out that graphics should not be eschewed entirely[7] -- despite the delays in download time.

The Research Design

This preliminary study of how readers view on-line publications with visuals versus those without visuals illustrates the importance of using graphics in this emerging means of communication. While download time was not a factor in this study, it is probably safe to say that these research findings would have been dramatically different had readers been forced to wait to view the accompanying visual.

For this study, two versions of an on-line publication were designed. One version used color photographs or drawings to accompany each news summary and each news story. The other version included the same news summaries and stories without the accompanying visuals.

Each version of the publication included three hypertexted layers of information. The first layer displayed three short news summaries with headlines to promote the top news story, the top feature story and the top sports story. The second layer displayed news summaries promoting the content of the four sections of the on-line publication -- news, features, sports and comment. The third layer displayed the entire text of the individual stories. Each layer displayed the name and date of the publication along the top and navigation bars providing access to the different sections or the front page along the bottom.

The publication was patterned with the goal of "intelligent information design[8]" in mind. Meyer stresses that organizational strategies such as headlines and story summaries can help to make an on-line newspaper "a model of predictable efficiency." Meyer points out that creating an efficient on-line newspaper, one that requires little effort on the part of the consumer, involves two basic areas: content and modality. He says, "Content can increase predictable efficiency by being well-organized and directed toward the areas of greatest interest among readers. Modality, or method of delivery, can increase predicable efficiency by reducing how far out of his or her way a reader must go to use the product." While on-line publication designers may not be able to reduce the extensive retrieval times required for the glitzy, graphics-filled publications, they can certainly affect how the information is organized.

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The two versions of the on-line publication were viewed by 30 undergraduates at Weber State University, who volunteered to participate in the study. The publication -- called "The Signpost" just like the student newspaper -- contained information relating to campus, but unlikely to have been read by these participants. The bulk of the stories were obtained from the WSU public information office and distributed outside the immediate campus area.

The average age of the subjects was 25. The average age of Web users is believed to be 35[9]. Eleven or 39 percent of the subjects were male, compared to 17 or 61 percent who were female. In contrast, 85 percent of Web users are believed to be male, while only 15 percent are female.

As for usage of the World Wide Web, about 30 percent of the subjects indicated they had never read an on-line publication. Another 50 percent indicated they had read an on-line publication at least once but fewer than five times. The final 20 percent indicated they were regular readers of on-line publications on either a monthly, weekly or daily basis. Two of these subjects were international students who use publications on the Internet to keep in touch with news from home.

The Readership

One of the most striking findings was the difference in the length of time subjects spent looking at the two versions of the publication. Subjects who viewed the visual version spent an average of almost 14 minutes scanning or intensively reading the content. In contrast, subjects who viewed the non-visual version spent just 10.6 minutes with the same information minus the photographs and illustrations. It should be noted that the difference would have been even greater because two of the subjects were stopped before they decided they were finished.

Without eye-tracking data, it is unclear how much time subjects in the visual version devoted to viewing photographs and illustrations. Clearly, some of the additional time the subjects in this group spent looking at the publication involved looking at the visuals. An earlier study by this researcher[10] showed that subjects fixated for about .72 seconds on photographs on a printed newspaper page. However, the photographs in the print study were considerably bigger than those used in this on-line study. Other studies[11] have shown that smaller photographs take less time to process because fewer fixations are needed to scan the information. Therefore, it seems likely that the time spent viewing photographs and illustrations in this study was less than .72 seconds per photograph.

The finding that subjects who viewed the visual version looked at a greater number of the complete stories than did those who viewed the non-visual version certainly affected the total viewing time. Viewers of the visual version looked at almost two more stories on average out of a total of 12 than did the viewers of the non-visual version. The numbers were 7.53 versus 5.60 respectively.

Obviously, content as well as visuals, plays a role in what stories subjects read. In this preliminary study, it was impossible to determine how much of an effect content plays in story selection. However, it clearly manifested itself -- especially in relationship to the sports stories. Some subjects purposely avoided all sports content, while others were immediately drawn to it and read it only. The effect of content was not nearly as apparent in the three other sections -- news, features and comment.

Research[12] has shown that on-line readers tend to be active information seekers, habitual skimmers of predictably efficient sources, or classic Internet surfers, taking whatever they find. The sources who actively sought out sports or purposely avoided it were making an active

decision, whereas the other sources exhibited the more classic scanning and skimming behavior of print newspaper readers.

On a different, but related topic, the subjects in the two groups made approximately the same number of clicks as they navigated through the material. In the visual version, subjects made an average of 19.67 mouse clicks, compared to 15.00 made by the subjects exposed to the non-visual version.

The Recall

Subjects who viewed the visual version were able to recall slightly more stories than those subjects who viewed the non-visual version. Specifically, subjects who saw photographs and illustrations as well as text were able to freely recall 5.53 of the total 12 stories. In comparison, subjects who didn't see photographs and illustrations were able to freely recall 4.62 of the stories.

While recall levels were slightly different between the two versions, the comprehension differences were not nearly as pronounced. Subjects who viewed the visual version got about 84 percent of the questions pertaining to the information they looked at correct. Subjects who viewed the non-visual version got almost 80 percent of the questions right. Perhaps there is little difference between the comprehension levels of the two versions because the questions were centered solely around the textual material. However, it may be possible that the presence of a visual element may not increase the comprehension of the accompanying text in an on-line publication, but instead acts only to increase the chances that a story will be looked at.

Indeed, after the study, a substantial number of students remarked that they liked reading an electronic version of a newspaper and thought it was easier to get their information on screen as opposed to on paper. Perhaps this can be attributed to the fact that many of these college students spend a lot of time working on computers. Or perhaps it can be attributed to the novelty of getting news information from computers. An interesting follow-up study would be to compare the comprehension levels of print editions to on-line editions.

Because the on-line publication used in this study was designed with news summaries that prioritized and promoted the stories on the first two levels, and with complete stories on the third level, comprehension levels were also analyzed according to these levels. In order to facilitate this analysis, two multiple-choice questions were written for each story -- one that centered on information contained in the headline and/or news summary and another that centered on information contained within the story itself.

The results showed that the comprehension of information contained on the so-called "front page" of the publication was the highest of the three levels. Apparently, as with a traditional newspaper, readers pay attention to the content on the front page knowing that editors place what they consider to be the most important stories of the day there. In this study, subjects got about 87 percent of the questions dealing with the information on the "front page" correct. Subjects in the visual version got the questions right 93 percent of the time compared to 79 percent of the time for subjects in the non-visual version. It is possible that the photographs accounted for the difference between the percentages.

On the second level, overall subjects got the questions right 82 percent of the time. Subjects in the visual version got the questions right 87 percent of the time, compared to 76 percent of the time for subjects in the non-visual version.

Finally, on the third level -- the level where subjects were exposed to the story in its entirety -- the comprehension level fell considerably. Specifically, subjects got only 54 percent of the

questions correct relating to information contained in the body of stories. Subjects in the visual version got the information right 57 percent of the time, compared to 52 percent of the time for subjects in the non-visual version. There are probably several reasons for the dramatic reduction on comprehension level. First, subjects were not as likely to read the complete text of a story as they were to read the news summaries. And second, the processing of relatively large chunks of text unaccompanied by visuals is not as attractive and is more difficult for readers to do. These results indicate the importance of prioritizing and summarizing the news content to facilitate the skimming and scanning behavior so prevalent amongst readers of print editions and apparently also of electronic editions.

And The Reaction To...

At the end of the study, to gauge reaction to on-line publications with photographs and graphics and those without, subjects were shown both versions and asked which one they preferred. All of the subjects reported preferring the visual version to the non-visual version. Subjects reported that visuals made the information seem "more alive," "exciting," "interesting," and that the visuals were "stimulating," "grabbed my attention," and "helped draw me into story." Some subjects also reported that the visuals "help me retain information," and "provide information in more depth." In regards to why they didn't like the text-only version, most subjects simply said that version was "boring."

Subjects were also asked which version of the publication was easier to read. About 89 percent of them said the version with visuals was easier to read. The other 11 percent thought the text-only version was easier to read because they were not distracted by the use of photographs and illustrations.

Finally, subjects were asked if they would read the student newspaper if it were presented on-line. A little over half, or about 56 percent of the subjects answered "yes" unequivocally. The other 44 percent said they would not. However, on a follow-up question, all but one of the subjects who said they would not read the on-line newspaper said that they would consider reading the electronic version sometimes if it were as readily available as the print edition. Many commented that it was more convenient to pick up a newspaper out of the newsstand or that they didn't have access to a computer to read an on-line publication.

In his research, Meyer[13] found little potential for on-line readership to substitute for print readership In a study of 1,235 self-selected readers of the NewsLink on-line publication list, 79.7 percent reported that the frequency with which they read print versions had either stayed the same or increased since they discovered on-line version. This includes 42.9 percent who reported reading the print version just as often as they had in the past. A surprising 7.5 percent reported reading it more often, and 29.3 percent said they had never before read the print version. Meyer also found a small decline in frequency of print readership by some readers. When asked how often they read various versions of their favorite on-line publication, 20.3 percent reported reading the print version less often now that they had found the on-line version.

The Rest Of The Observations

Because this preliminary study is one of the first to examine how readers read an on-line publication, a few general observations seem to be in order. It appears as though readers may prefer to have their news prioritized and organized for them in much the same manner as it is currently done with print editions. In this limited study, one-third of the subjects took the time to

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read the "lead" story first. One-half of the subjects read one of the other two front-page stories first. Therefore, almost 80 percent of the subjects read one of the three front page stories before moving on to another page.

But Meyer's research[14] shows that the majority of on-line publications do not offer the day's top headlines and news stories on their home page. Meyer found that more than half of the newspapers do not offer a single headline within the top screen of their designated initial pages. Only one in 10 offer some form of news summary but make it clearly secondary to standing features or promotional material. His research also shows that fewer than one in five offer more than two or three changeable headlines on their initial pages each day. And few of these provide, prior to any significant promotional material, both a general news headline and a "lead," or summary, similar to what a traditional front page might provide.

The summaries received considerable amount of attention from the subjects in this study. Almost 70 percent of the subjects looked at all of the summaries for all of the stories. Subjects in the visual version were a little more likely to look at all of the summaries than were subjects in the non-visual version, but it is unknown what effect the visuals played here. In many cases, the subjects who did not look at all of the summaries appeared to skip sections intentionally based on content. For example, many of these subjects looked at all of the summaries, except sports. A few looked at only sports.

Another interesting observation from this study is that when the subjects called up the complete text of the story on the computer screen, the majority appeared to read the entire piece. This finding is in stark contrast to how the majority of readers behave with a story on a piece of paper[15]. In the study, all of the news stories displayed as either news, features or sports were written in the traditional inverted pyramid form, which would permit readers to read the first few paragraphs and come away with the gist of the story. This appears to be what happens in print, unless subjects happen to be particularly interested in a story. But on the computer screen, readers may read more.

There may be several explanations to this difference in behavior. Subjects may have purposely read the stories anticipating they would be asked about the content as part of the test. Subjects may have been intrigued by the novelty of reading a publication on screen -- a new experience for many of them. However, subjects may have read to the end of stories because the display on the computer screen is less confusing than that on a newspaper page. In this on-line publication, only one complete story with all of its related elements (headline and photograph) was displayed on the computer screen, whereas on a traditional newspaper page numerous stories are competing for attention, text is displayed in relatively narrow columns of type, and many stories jump to other pages. Subjects may have also read to the bottom of the stories because the placement of the navigational bars at the bottom of the text encouraged this behavior.

Summary

It will only be a matter of time (and probably not much time by the rate things are going) before Internet hookups will allow visual images to be transmitted almost instantaneously across the World Wide Web. While this technological issue is being resolved by computer scientists, journalists need to resolve the important issues facing them -- packaging techniques of on-line news presentation. Surely the packaging will involve visuals -- it will have to in order to attract an audience. The results of this preliminary study about the effects of visual images on the recall, readability and reaction to on-line publications indicate that photographs and illustrations are just

as important on the computer screen as they are on the printed page. But they must be used wisely.

As Meyer[16] points out in his research report: "Sizzle may sell an individual steak, but better sizzle cannot make a spoiled steak taste good. In a business that depends upon habitual buying, sizzle may get customers in the door, but a bad steak will cause them never to come back."

If publishers hope to establish habitual use of their on-line publication, obviously they must not forego visuals, but they must forego the gratuitous use of visuals. They must remember that the readers' reaction to the information, their ability to read it efficiently and recall it when necessary are paramount. Let's study it more.

Bibliography

1. Mario R. Garcia and Pegi Stark, *Eyes on the News* (St. Petersburg, Florida: Poynter Institute for Media Studies, 1991).

2. James D. Kelly, "The Effects of Display Format and Data Density on Time Spent Reading Statistics in Text, Tables and Graphs. *Journalism Quarterly*, spring 1993, pp. 140-149.

3. Robert P. Hart and Gregory J. O'Shanick. "Retention Interval and Verbal vs. Pictorial vs. Figural Stimuli," *Journal of Clinical and Experimental Neuropsychology*, March 1993, pp. 245-265.

4. John C. Malley, David B. Meinert and Robert V. Riech, "A Guide to the Potential Misuse of Computer graphics," *Information Strategy: The Executive's Journal*, summer 1993, pp. 39-47.

5. J. W. Click and Guido H. Stempel, III, "Reader Response to Front Pages with Four-Color Halftones," *Journalism Quarterly*, winter 1976, pp. 736-738.

6. Eric K. Meyer, *Tomorrow's news today: A guide to strategic planning for on-line publishing by general-circulation newspapers* (Pewaukee, Wisconsin: NewsLink Associates, 1995), p. 86.

7. Meyer, op. cit. p. 86.

8. Meyer, op. cit., p. 70.

9. 3rd Graphics, Visualization and Utility/Hermes WWW User Survey. Available on-line: http://www.umicy.edu/-sgupta/hermes/

10. Sheree Josephson, "*Eye Movement in Newspapers: A Comparison of the Number of Fixations, Fixation Duration and Scan Path Data on Pages with Color and Black-and-white Photographs*," (Dissertation, 1992).

11. Garcia and Stark, op. cit.

12. W. Russell Neuman, *The Future of the Mass Audience* (Cambridge, England: Cambridge University Press, 1991), p. 95.

13. Meyer, op. cit, p. 102.

14. Meyer, op. cit., p. 49.

15. Garcia and Stark, op. cit.

16. Meyer, op. cit., p. 153.